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XVII. *Description of the Mineral Bason in the Counties of Monmouth, Glamorgan, Brecon, Carmarthen, and Pembroke.*  
*By Mr. Edward Martin. Communicated by the Right Hon.*  
*C. F. Greville, F. R. S.*

Read May 22, 1806.

1. **T**HE irregular oval line, delineated on the annexed map (Plate XIV.) shows nearly the inner edge of a limestone bason, in which all the strata of coal and iron ore (commonly called Iron Stone) in South Wales are deposited; the length of this bason is upwards of 100 miles, and the average breadth in the counties of Monmouth, Glamorgan, Carmarthen, and part of Brecon, is from 18 to 20 miles, and in Pembrokeshire only from 3 to 5 miles.

2. On the north side of a line, that may be drawn in an east and west direction, ranging nearly through the middle of this bason, all the strata rise gradually northward; and on the south side of this line they rise southward, till they come to the surface, except at the east end, which is in the vicinity of Pontipool, where they rise eastward.

3. The depths from the surface to the various strata of coal and iron ore depend upon their respective local situations.

4. The deepest part of the bason is between Neath, in Glamorganshire, and Llanelly, in Carmarthenshire; the uppermost stratum of coal here does not extend a mile in a north

and south direction, and not many miles in an east and west direction, and its utmost depth is not above 50 or 60 fathoms.

5. The next stratum of coal, and those likewise beneath it, lie deeper and expand still longer and wider, and the lowest which are attended by parallel strata of iron ore, of which there are in some situations about 16 accompanied by irregular balls or lumps of iron ore, occupy the whole space between Llanmaddock Hill, near the entrance of Burry river, to Llanbidie, from the Mumbles to Cribbath, from Newton Down to Penderryn, from Castle Coch to Castle Morlais, and from Risca to Llangattock, and in length on the south side of the bason from Pontypool through Risca, Tinkwood, Llantrissent, Margam, Swansea Bay, and Cline Wood, to Llanmaddock Hill, and on the north side through Blaenafon, Ebbw, Sirhowy, Merthyr, Aberdare, Aberpergwm, Glyntowy, Llandibie, and the Great Mountain, to Pembrey Hill, near Llanelly in Carmarthenshire, and their depths are at the centre range of strata from 6 to 700 fathoms.

6. The strata of coal and iron ore running from Pembrey Hill, through Carmarthen Bay and Pembrokeshire to St. Bride's Bay, are only a continuation of those in the counties of Glamorgan and Carmarthen, which lie next to and parallel with the north side of the bason, all the remaining strata rising southward; and the middle ranges on the north side of the bason, are lost between where they meet the sea near Llanmaddock Hill and the south side of Pembrey Hill, in their course towards Pembrokeshire, in consequence of a contraction of the sides of the mineral bason, or rather by its becoming shallower; for in Pembrokeshire none of the strata of coal or iron ore lie above 80 or 100 fathoms deep, consequently

all those which do not lie above 5 or 600 fathoms in Glamorganshire and Carmarthenshire have not reached this county, by reason of the bason not being of sufficient depth and width to hold them.

7. The strata of coal at the east end of the bason running from Pontypool to Blaenafon and Clydach, and on the north side from thence to Nanty Glo, Ebbw, Beaufort, Sirhowy, Tredegar, Romney, Dowlais, Penderryn, Plymouth, Cyfarthfa, Abernant, Aberdare and Hurwain Furnaces and Iron Works, are of a cokeing quality, and from thence the whole strata of coal to St. Bride's Bay alter in their quality, to what is called Stone Coal, (the large of which has hitherto been used for the purposes of drying malt and hops, and the small, which is called Culm, for burning of limestone); the several strata of coal from Pontypool, on the south side of the bason, through Risca, Llantrissant, Margam, and Cline Wood, to Burry River, Llanelly, and the south side of Pembrey Hill, are principally of a bituminous or binding quality.

8. Notwithstanding the principal strata of coal in Glamorganshire, lie from 5 fathoms to 6 or 700 fathoms deep, still it has not been necessary to pursue these strata deeper than about 80 fathoms.

9. The veins of coal and iron ore, in the vicinity of most of the iron works in Monmouthshire and Glamorganshire are drained and worked by levels or horizontal drifts, which opportunity is given by the deep valleys which generally run in a north and south direction, intersecting the range of coal and iron ore, which run in an east and west direction, under the high mountains, and thereby serving as main drains, so that the collier or miner here gets at the treasures of the

earth, without going to the expence and labour of sinking deep pits, and erecting powerful fire-engines. However, in process of time, in situations where the coal and iron ore that are above the level of these natural drains, become exhausted, it will be found necessary to sink shallow pits, and erect fire-engines for the draining and working of the coal and iron ore, and at a future period, pits of greater depths, must be sunk for the same purposes.

10. There are 12 veins or strata of coal in this mineral depository, from 3 feet to 9 feet thick each; which together make  $70\frac{1}{2}$  feet: and there are 11 more, from 18 inches to 3 feet, which make  $24\frac{1}{4}$  feet, making in all 95 feet; besides a number of smaller veins from 12 to 18 inches, and from 6 to 12 inches in thickness, not calculated upon.

11. By taking the average length and breadth of the foregoing different strata of coal, the amount is about 1000 square miles, containing 95 feet of coal in 23 distinct strata, which will produce in the common way of working 100,000 tons *per* acre, or 64,000,000 tons *per* square mile.

12. If the whole extent of this mineral country was an even plain, the border or outbreak of each stratum would appear regular and true; but owing to the interposition of hills and valleys, the edges of the strata, if nicely measured and planned, would seem indented and uneven, yet in many instances the due range is totally thrown out of course, in consequence of knots, dikes, or faults.

13. These faults or irregularities are not confined to the edges of the strata, but they take grand ranges, through the interior of the bason, generally in a north and south direction, and often throw the whole of the strata, for hundreds of acres

together, 40, 60, 80, or 100 fathoms, up or down, and still there is seldom any superficial appearance, that indicates a disjunction, for the largest faults frequently lie under even surfaces.

14. As every stratum rises regularly from its base to the surface, and is frequently visible and bare, in precipices and deep dingles, and often discovered where the earth or soil is shallow in trenching, or in forming high roads, and by reason of the whole of the country within this boundary being so perforated by pits, and so intersected by the various operations of art and nature, it is not probable that any vein of coal, iron ore, or other stratum remains undiscovered in this mineral bason.

15. Glamorganshire engrosses far the greatest portion of coal and iron ore, Monmouthshire the next in point of quantity, Carmarthenshire the next, Pembrokeshire the next, and Brecknockshire possesses the least.

16. The strata of coal and iron ore in the last named county, which are the lowest in the bason, break out northward, and only take place in the three following distinct spots, *viz.* 1st. From Turch River (which is the boundary between Lord CAWDOR and CHARLES MORGAN, Esq.) across the river Tawe and the Drin Mountain to the great forest of Brecon. 2d. A corner of ground from Blaen Romney to the north of Brynoer. 3d. Another spot, from Rhyd Ebbw and Beaufort Iron Works, through Llwyn y Pwll, near Tavern Maed Sur, to where it joins Lord ABERGAVENNY's mineral property.

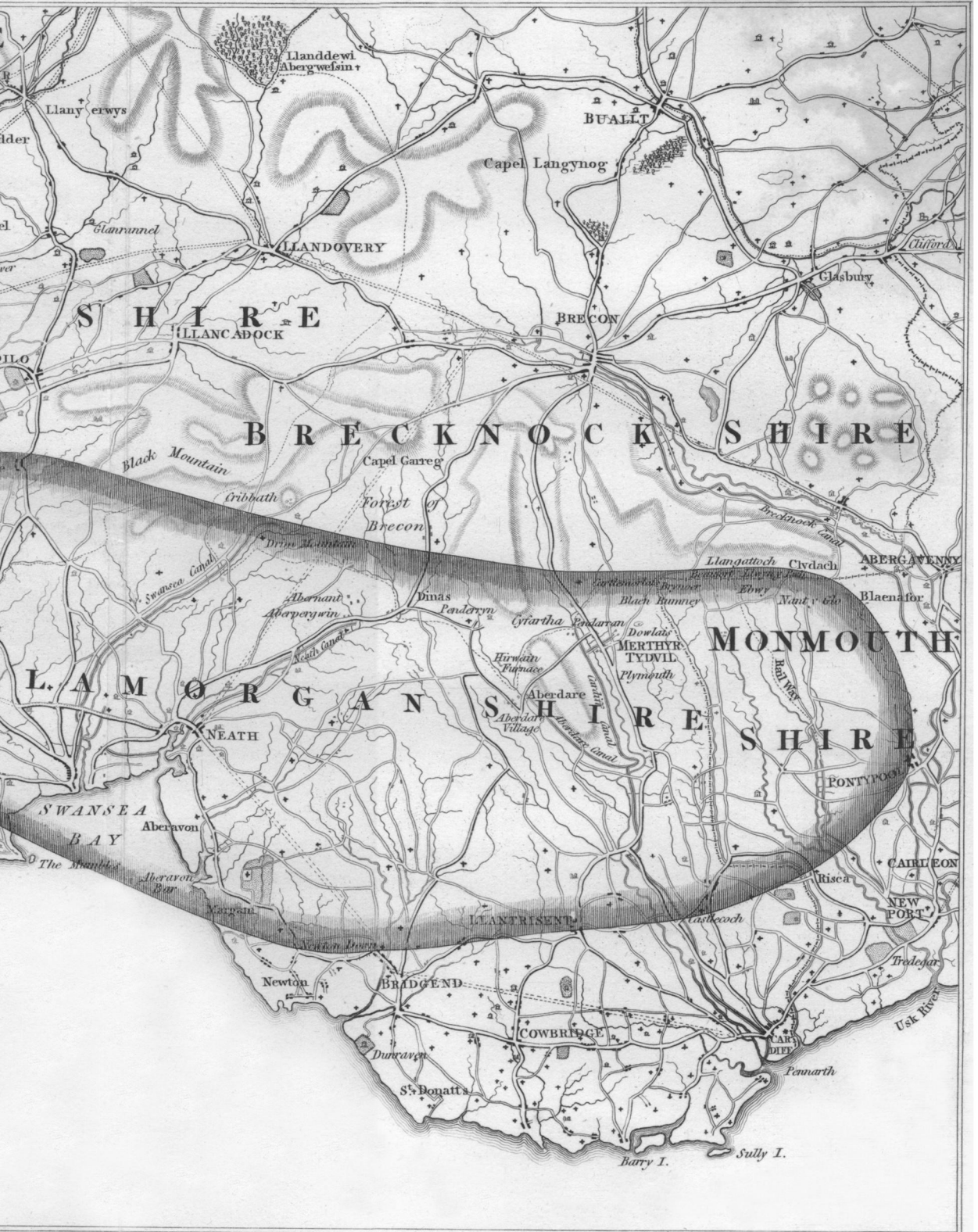
17. *Note.* A principal fault is observable at Cribbath, where the beds or strata of the limestone stand erect: another,

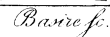


Worms Head









of considerable magnitude, lies between Ystradvellte and Penderryn, where all the strata on the north side of the bason are moved many hundreds of yards southward (as at Dinas).

18. *Note.* The limestone appears to the surface all along the boundary line in the counties of Monmouth, Glamorgan, Carmarthen, Brecon, and no doubt can be entertained of its due range from Newton across Swansea Bay to the Mumbles, and from Llanmaddock Hill across Carmarthen Bay to Tenby. In Pembrokeshire it appears to the surface on the south side of the bason, at Tenby, Ivy Tower, Cochelard, Bit Church, Williamston, Lawrinny, Cord, Canta, and Johnston; and on the north side of the bason, at Templeton, Picton, Harriston, and Persfield; yet it certainly forms an underground connection from point to point.